Terpsichore, a New Genus of Grammitidaceae (Pteridophyta)

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ABSTRACT. *Terpsichore*, a new genus of Grammitidaceae, is described and combinations are made for the species known to belong to it. *Terpsichore* differs from other genera in the family by the combination of the following characters: the presence of usually conspicuous hydathodes that sometimes produce calcareous secretions; reddish to atropurpureous (less often hyaline) setae mostly 1–3 mm along the stipe, rachis, costae, and (sometimes) lamina; nonclathrate, usually castaneous to blackish rhizome scales that are usually setulose along the margins; and free, unbranched, pinnate venation in the segments of pinnae. The genus comprises about 50 species and is primarily neotropical; one species is known from Africa and offshore islands. A key is provided to distinguish the neotropical genera of Grammitidaceae.

This is the last in a series of papers describing new genera of neotropical Grammitidaceae. Earlier papers dealt with the anhydathodous genera *Ceradenia* (Bishop, 1988), *Zygophlebia* (Bishop, 1989), and *Enterosora* (Bishop & Smith, 1992), while more recently the hydathode-bearing genera *Lellingeria* (Smith et al., 1991), *Melpomene* (Smith & Moran, 1992), and *Micropolypodium* (Smith, 1992) have been delimited. Species of *Terpsichore* also have hydathodes, sometimes with calcareous secretions. There are approximately 50 known species, making it about equal in size to *Lellingeria* and *Ceradenia*.

The distinctness of *Terpsichore*, named for the Greek muse of dance, was first realized by the late L. Earl Bishop. Unfortunately, he was unable to advance the work beyond the use of the name in labeling some of his own collections. I have made a search of herbaria (UC and MO), recent floristic accounts for Latin American countries (Proctor, 1977, 1985, 1989; Stolze, 1981; Mickel & Beitel, 1988; Lellinger, 1989), Copeland's monograph of *Ctenopteris* (1956), and other relevant literature to determine those species that should be transferred to the new genus.

The following artificial key is provided to distinguish *Terpsichore* from its New World congeners:

ARTIFICIAL KEY TO GENERA OF NEOTROPICAL GRAMMITIDACEAE

1. Laminae entire or with margin slightly repand, rarely 1–2-forked with divisions entire 2
1. Laminae shallowly to deeply lobed to pinnatifid or 1-pinnate, rarely pinnate-pinnatifid 8
2(1). Veins connected by a marginal vascular strand, thus forming a row of areoles along each side of midrib; Greater Antilles .... *Lomaphlebia*
2. Veins free, or only casually and infrequently anastomosing; widespread in the Neotropics 3
3(2). Sori intermixed with whitish, stipitate, spherical glands .... *Ceradenia jungermannioides* (Klotzsch) L. E. Bishop
3. Sori lacking glands, or glands, if present, not whitish 4
4(3). Laminae with a dark brown to black sclerenchymatous border .... *Grammitis* sect. *Grammitis*
4. Laminae lacking a strongly differentiated dark border 5
5(4). Stipes and laminae with numerous dark setae greater than 1 mm 6
5. Stipes and laminae lacking dark setae, or if such setae present then these usually few and less than 1 mm 7
6(5). Rhizomes short-creeping; sori round or nearly so; tropical America ..... *Enterosora*
6. Rhizomes long-creeping; sori oblong to short-linear; southern Chile and Argentina ... . *Grammitis patagonica* (C. Christensen) Parris
7(5). Hydathodes present; tropical America .. .. *Cochlidium*
7. Hydathodes usually absent (sometimes present in *G. magellanica* Desvaux); southern Chile and Argentina .... *Grammitis* sect. *Grammitastrum*
8(1). Hydathodes absent or obscure on adaxial surface of lamina 9
8. Hydathodes present at the ends of veins on adaxial surface of the laminae 12
9(8). Laminae simple, a single blade differentiated into serrate, sterile, proximal part and an entire, usually fertile, distal part .... *Cochlidium serrulatum* (Swartz) L. E. Bishop
9. Laminae sinuate, shallowly lobed, or more often pinnatifid to pinnate (rarely more divided), not differentiated into distinct sterile and fertile parts 10

10(9). Sori with conspicuous, whitish, spherical, waxlike paraphyses (most easily seen in young fronds); veins free ..... *Ceradenia*
10. Sori lacking evident waxlike, spherical paraphyses, or if paraphyses evident these brownish and not waxlike; veins often anastomosing to form regular or irregular areoles 11
11(10). Laminae sinuate, or lobed no more than ¾ the distance to the midrib ..... *Enterosora*
11. Laminae deeply pinnatifid or pinnatisect nearly to the midrib ..... *Zygophlebia*
12(8). Scales of rhizomes lacking setulae (often bearing papillate glands less than 0.1 mm at tip), strongly clathrate, often iridescent; rhizomes long-to short-creeping, strongly dorsiventral ..... *Melpomene*
12. Scales of rhizomes setulose or not, not clathrate, or if clathrate, then setulose; rhizomes generally short-creeping to suberect, radial or weakly dorsiventral, rarely strongly dorsiventral 13
13(12). Main vein (costa) in the segments (or pinnae) simple (lacking branches) or with a single acroscopic veinlet; sori only one per segment or pinna; laminae narrowly linear, usually less than 1 cm wide; rhizomes radially symmetric 14
13. Main vein (costa) in the segments (or pinnae) with more than 1 branch; sori usually more than one per segment or pinna; laminae usually lanceolate to ovate, usually more than 1 cm wide; rhizomes radially to dorsiventrally symmetric 15
14(13). Rhizome scales golden to orangish or light brownish, not clathrate; castaneous or red-brown simple (unforked) setae more than 1 mm long generally present on midribs and sometimes on lamina . *Micropolypodium*
14. Rhizome scales dark brown to blackish, clathrate; castaneous or red-brown setae generally lacking on midribs and lamina, if present then less than 0.5 mm long and often unequally forked ..... *Lellingeria*
15(13). Scales clathrate; sori often slightly to deeply immersed in the lamina; stipes and rachises with hyaline to light reddish setulae 0.1–0.3 mm, lacking dark setae; rhizomes ascending, radially symmetric ... *Lellingeria*
15. Scales not clathrate; sori superficial; stipes and rachises generally with dark setae more than 0.5 mm; rhizomes short-creeping to ascending, dorsiventral to radial . *Terpsichore*

Terpsichore A. R. Smith, gen. nov. TYPE: *Polypodium asplenifolium* L., Sp. Pl. 2: 1084. 1753. ≡ *Terpsichore asplenifolia* (L.) A. R. Smith. Figure 1.

Plantae plerumque epiphyticae; rhizomata infirme dorsiventralia vel radialia; squamae rhizomatis non clathratae, plerumque brunneolae, atropurpureae, vel nigrescentes, concolores, margine plerumque setulosae; folia plerumque pinnatisecta, cum hydathodis adaxialiter, interdum exsudatis calcareis efferentibus; laminae interdum fungis ateris clavatis praeditae; petioli et rhachides setosi, setis castaneis vel atropurpureis, interdum albidis; venae librae non furcatae; sori rotundi superficales, sine glandibus.

Plants epiphytic, rarely saxicolous or terrestrial; rhizomes short-creeping to ascending, generally weakly dorsiventral to radial, the scales nonclathrate, brown to blackish, infrequently orangish, concolorous, dull to usually shining, glabrous or with variously colored (hyaline to castaneous) setae; phyllopodia present or absent; petioles nearly absent to equaling the lamina, setose (especially proximally) and sometimes also puberulent, the setae 0.5–3 mm, usually reddish or castaneous, numerous, spreading, the hairs 0.1–0.2 mm, branched or unbranched, pale reddish, sometimes glandular; laminae pinnatisect to 1-pinnate, rarely 1-pinnate-pinnatifid, forking in a few spp., monomorphous, usually setose (at least along the rachis); hydathodes present, sometimes producing calcareous secretions (whitish lime-dots); veins simple, pinnate from the costae, free, hidden or easily visible; sori round, not sunken into the lamina, without paraphyses; sporangial capsules glabrous or setose; spores globose-tetrahedral, oblate, or reniform, with a trilete or monolete laesura. $x = 37$.

Distribution. Terpsichore comprises about 50 neotropical species, with one, *T. cultrata*, extending into Africa (Schelpe, 1969), Madagascar (Tardieu-Blot, 1960), and the Mascarenes.

It is uncertain whether African material called *T. cultrata* is really conspecific with New World material of the same species, but if not, plants from the two areas are certainly closely allied. It is highly interesting, and suggestive of antiquity for the Grammitidaceae, that most of the genera of neotropical Grammitidaceae, including *Terpsichore*, *Ceradenia*, *Enterosora*, *Lellingeria*, *Melpomene*, *Zygophlebia*, *Grammitis* sensu stricto, and *Cochlidium*, are also represented by one or a few species in Africa and islands of the Indian Ocean (Smith, 1993); these same genera, with the exception of *Lellingeria* and *Grammitis*, are absent from southeast Asia and the Pacific.

Characters defining *Terpsichore* include the presence of rather conspicuous hydathodes on the adaxial surface of the laminae; castaneous or atropurpureous to whitish setae along the stipe, rachis, costae, and sometimes lamina; setae usually dense at the stipe bases, absence of glandular paraphyses in the sori; nonclathrate, usually castaneous or atropurpureous (occasionally blackish or orangish), concolorous rhizome scales that are usually setulose along the margins, or at least at the tip, and sometimes on the surfaces; rhizomes generally weakly dorsiventral to radial in symmetry; and free, un-

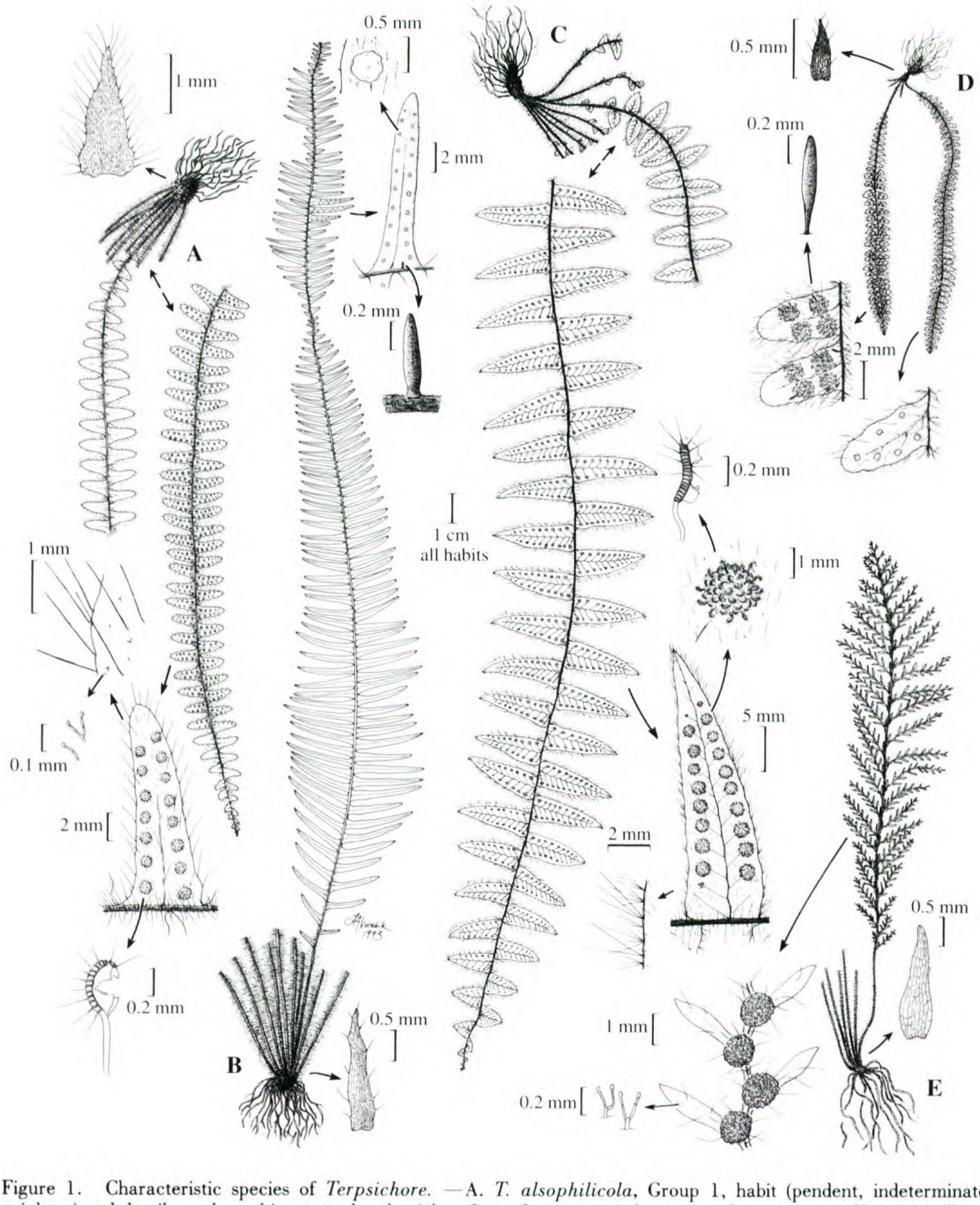

Figure 1. Characteristic species of *Terpsichore*. —A. *T. alsophilicola*, Group 1, habit (pendent, indeterminate epiphyte) and details to show rhizome scale, abaxial surface of segment, indument, and sporangium (*Knapp & Kress 4315*, UC). —B. *T. alsopteris*, Group 2, habit (erect-arching) and details to show rhizome scale, fungal fruiting body from rachis, and calcareous secretions from hydathodes on adaxial surface (*van der Werff & Palacios 10589*, UC). —C. *T. longa*, Group 3, habit (pendent indeterminate epiphyte) and details to show sporangia, paired and clustered setae on pinna margin (*van der Werff et al. 9488*, UC). —D. *T. subtilis*, Group 4, habit (arching-pendent) and details to show rhizome scale, abaxial surface of segments, fungal fruiting body in sorus, and calcareous secretion from hydathodes on adaxial surface (*van der Werff & Palacios 9147*, UC). —E. *T. longisetosa*, Group 5, habit (± erect) and details to show rhizome scale, abaxial surface of segments, and branched laminar hairs (*Herrera 3670*, UC).

branched veins from the costae of the segments or pinnae.

The most similar species to *Terpsichore* currently are classified in *Ctenopteris*, a diverse and probably polyphyletic genus typified by the Old World species *C. venulosa* (Blume) Kunze. A synonym of *Ctenopteris* is *Cryptosorus* [synonym: *Grammitis* sect. *Cryptosorus* (Fée) R. M. Tryon & A. F. Tryon], type *Cryptosorus blumei* Fée [≡ *Ctenopteris obliquata* (Blume) Copeland], also Old World. The type species of both *Ctenopteris* and *Cryptosorus*, as well as many allied Old World species (see Parris, 1990: 82), lack hydathodes, have subclathrate rhizome scales, and have sori sunken in crypts. In these three characteristics, *Ctenopteris* differs from all species here included in *Terpsichore*. Some other Old World species included in *Ctenopteris* do have hydathodes, nonclathrate rhizome scales, and nonsunken sori, characteristics that might suggest a closer affinity to *Terpsichore*. The affinities of the "nontypical," Old World *Ctenopteris* species need further study, but it seems clear that *Terpsichore* is not congeneric with any genus of Grammitidaceae based on an Old World type.

Certain species of *Terpsichore*, especially those in the *T. taxifolia* group (Group 2, below), also resemble *Pecluma* (Polypodiaceae) because of their pectinate laminae. *Pecluma*, however, has short phyllopodia, yellow, bilateral, monolete spores, and often comose rhizome scales; species of *Pecluma* also lack stout castaneous setae and black clavate fungi. It seems likely that the resemblance is the result of convergent evolution and is not an indication of any close affinity between the two genera.

In his revision of American *Ctenopteris*, Copeland (1956) treated the species of *Terpsichore* in seven of his nine species groups, exemplified by the following seven species: *Ctenopteris senilis*, *C. capillaris*, *C. elastica*, *C. pendula*, *C. suspensa*, *C. sericeolanata*, and *C. meridensis*. Copeland's groups bear little or no resemblance to the genera as Bishop and I have circumscribed them, and in fact Copeland's groups of species are mostly highly artificial assemblages based on size and dissection of the fronds, characters that are completely unreliable in defining natural groups of species in Grammitidaceae.

Species of *Terpischore* can be rather easily divided into the following five groups, which could conveniently be regarded as natural sections of the genus (Fig. 1).

Group 1. *Terpsichore asplenifolia* Group (12 spp.).—Fronds arching, blades determinate; rhizomes weakly dorsiventral to radial; rhizome scales orange to brown, setulose on margins and often surface; sporangia setose (except *T. atroviridis*); blades lacking black clavate fungal fruiting bodies; stipes distinct, the pinnae not reduced to base of frond; laminae with solitary setae; hydathodes lacking calcareous secretions (Fig. 1A).

Group 2. *Terpsichore taxifolia* Group (13 spp.).—Fronds arching to erect, blades determinate; rhizomes generally dorsiventral; rhizome scales castaneous, setose at tip and/or margins; sporangia glabrous; blades with black clavate fungal fruiting bodies (except *T. paulistana*); stipes distinct, the pinnae not reduced to base of frond; laminae with solitary setae; hydathodes often producing calcareous secretions (Fig. 1B).

Group 3. *Terpsicore lanigera* Group (16 spp.).—Fronds pendent, blades indeterminate; rhizomes generally radially symmetric; rhizome scales hairy on margins and often surface, or sometimes absent (*T. alfarii*); sporangia setose (except *T. delicatula*, *T. jamesonioides*, and *T. spathulata*); blades lacking black clavate fungal fruiting bodies; stipes usually less than 1 cm long, the pinnae reduced nearly to base of frond; laminae with tendency for paired or clustered setae (except *T. delicatula*, *T. jamesonioides*); hydathodes producing calcareous secretions in a few spp. (Fig. 1C).

Group 4. *Terpsichore subtilis* Group (2 spp.).—Fronds arching or directed downward, sometimes pendent, blades indeterminate; rhizomes weakly dorsiventral to radial; rhizome scales blackish, with a single apical seta or marginally setulose; sporangia glabrous; blades with black clavate fungal fruiting bodies; stipes less than 1 cm long, the pinnae reduced nearly to base of frond; laminae with solitary setae; hydathodes producing calcareous secretions (Fig. 1D).

Group 5. *Terpsichore achilleifolia* Group (3 spp.).—Fronds arching, blades determinate; rhizomes generally weakly dorsiventral; rhizome scales orangish to orange-brown, entire to glandular to sparingly setose on margin; sporangia glabrous; blades lacking black clavate fungal fruiting bodies; stipes distinct, the pinnae not reduced to base of frond; laminae with solitary setae; hydathodes lacking calcareous secretions (Fig. 1E).

The relationships among these groups are uncertain. The pendent, nearly estipitate fronds, radially symmetrical rhizomes, clustered setae, and usually setose sporangia of the *T. lanigera* group are probably derived features. In frond form, the *T. asplenifolia* group seems to be ancestral, possibly having given rise to *T. taxifolia* and allies, all but one of which bear black clavate fungi. Species in both the *asplenifolia* and *taxifolia* groups have more or less weakly dorsiventral rhizomes, thought by Bishop (1989) to be an ancestral condition in the family. In its orangish, entire or sparingly setose rhizome scales, the *T. achilleifolia* group is aberrant

TABLE 1. Spores of *Terpsichore*, *T. lanigera* group. Vouchers are all in UC. Less common conditions are in parentheses. Bo = Bolivia; Br = Brazil; C = Colombia; CR = Costa Rica; E = Ecuador; G = Guatemala; M = Mexico; Pa = Panama; Pe = Peru; V = Venezuela. e = ellipsoid; mo = monolete; o = oblate; t = tetrahedral; tr = trilete.

Species	Shape	Laesura	Number of cells	Voucher	Locality
T. alfarii	o	tr	1	*Fiedler 159*	CR
T. cultrata	e	mo	2	*Steyermark 48601*	G
	e	mo	2 (1)	*Silverstone-Sopkin 3614*	C
	t–o	tr	1 (2)	*Steyermark & Wurdack 1177*	V
	e	mo	1 (2)	*Steyermark 100715*	V
	t–o	tr	1 & 2	*Kral 71972B*	V
	t–o	tr	1 & 2	*Kummrow 2153*	Br
	t–o	tr	1 (2)	*Hutchison & Wright 5582*	Pe
	e & o	mo & tr	1 & 2	*Fay & Fay 2184*	B
T. delicatula	o	tr	1 (2)	*Smith 471*	M
T. hetermorpha	t–o	tr	1 & 2	*Cerón 1207*	E
	t–o	tr	1	*Øllgaard 34281*	E
T. jamesonioides	o	tr	1 & 2	*Bishop 2520*	Pe
T. lanigera	t–o	tr	1	*Herzog 2180*	Bo
	t–o	tr	1	*Wiggins 10768*	E
	t–o	tr	1	*Bishop 862*	CR
	e (o)	mo (tr)	1 & 2	*Mickel 3025*	CR
	e	mo	1 & 2	*Buchtien 5251*	Bo
	t–o	tr	1	*Sodiro s.n.*	E
T. laxa	e (o)	mo (tr)	1	*Bishop 2509*	Pe
T. longa	e	mo	1 (2)	*Gómez 21085*	CR
	e	mo	1 (2)	*Chacón 1518*	CR
	e	mo	1 (2)	*Palacios 5655*	E
	e	mo	1 & 2	*van der Werff 9488*	E
T. mollissima	e	mo	1	*Steyermark 49625*	G
	e	mo	1 & 2	*Skutch 5204*	CR
	e	mo	1 & 2	*Maguire 53790*	V
T. senilis	e	mo	2	*Breedlove 68357*	M
	e (t–o)	mo (tr)	1 & 2	*Bishop 861*	CR
	e	mo	1 & 2	*Gómez 22285*	Pa
	e	mo	2 (1)	*Smith et al. 1430*	V
	e	mo	1 or 2	*Steyermark & Liesner 118283*	V
T. spathulata	t–o	tr	1	*Purpus s.n.*	M
T. subflabelliformis	e	mo	1 & 2	*van der Werff 9148*	E
	e	mo	1 (2)	*Bishop 2515*	Pe
	e	mo	1 (2)	*Herzog 1985*	Bo
T. turrialbae	t–o	tr	1	*Smith 2073*	CR
	t–o	tr	1	*Bishop 859*	CR
T. xanthotrichia	e	mo	2	*Beitel 85083*	V

and may show a relationship to *Micropolypodium* or to some Old World species currently included in *Ctenopteris* (but not the type). The pinnate-pinnatifid fronds of three species belonging here are unusual in Grammitidaceae but are found in several species of *Lellingeria* (e.g., *L. suprasculpta*, *L. melanotrichia*). This character state (pinnate-pinnatifid lamina) has undoubtedly arisen several times among neotropical grammitids and also in the Old World genus *Ctenopteris* (e.g., *C. taxodioides* (Baker) Copeland, *C. bipinnatifida* (Baker) Copeland, and allies).

A peculiar feature in nearly all species of the *Terpsichore taxifolia* and *T. subtilis* groups is the presence of small (ca. 0.5–1.0 mm long), black, clavate fungi (presumably *Acrospermum maxonii* Farlow) on the abaxial laminae, particularly along the vascular tissue (rachis, costae, and veins) and in the sorus (Mickel, 1973). Not all fronds in a given collection will show this feature, but it is of such regular occurrence on at least some fronds of a gathering as to be diagnostic for the two groups. Most likely, the presence of this fungus on species in the two groups indicates a monophyletic origin

for this suite of about 15 species (Groups 2 and 4, below). The only other fern outside these groups that is a known host for this particular fungus is the grammitid *Melpomene anfractuosa* (Kunze ex Klotzsch) A. R. Smith & R. C. Moran.

Chromosome counts are known for a few species of *Terpsichore*, namely, *T. asplenifolia* ($n = 37$, $2n = 74$; Walker, 1966), *T. semihirsuta* ($2n$ = ca. 148; Walker, 1966), from Jamaica, and *T. lanigera* ($n = 37$; Evans, 1963, reported as *Ctenopteris cultrata*, a misidentification, UC 58-234-1), from Costa Rica. From these few reports, it would appear that the base number for the genus is $x = 37$, the same number found in several other grammitid genera, including *Ceradenia*, *Micropolypodium*, *Enterosora*, and *Melpomene*.

Tryon & Lugardon (1991: 363) provided an SEM photograph of a spore of *T. asplenifolia* that shows a spore that is nearly globose, with an obscure trilete aperture and finely papillate surface. Spores of other genera of Grammitidaceae shown in this work show similar features, but are sometimes more tetrahedral-globose and have more prominent apertures and papillae or surface globules. However, insufficient material has been studied to indicate the taxonomic significance, if any, of these variations in spore morphology in the family.

Wagner (1985) reported that spores of *Grammitis lanigera*, *G. senilis*, and several related grammitids had monolete laesurae. I confirm the presence of monolete spores in the first two species and in other species belonging to the *Terpsichore lanigera* group (Group 3, see below).

Ellipsoid, bilateral, monolete spores appear to be consistently present in *T. longa*, *T. mollissima*, *T. senilis*, and *T. xanthotrichia;* they are also sometimes present in *T. cultrata*, *T. lanigera*, and *T. laxa* (Table 1). The other species for which spore material has been available in Group 3 have globose-tetrahedral, trilete spores (Table 1), as do species examined in Groups 1, 2, and 4. The significance of ellipsoid, monolete spores in the genus is not known, but this character state is undoubtedly derived and does not indicate affinity with *Pecluma* or any other extant genera of Polypodiaceae, which nearly always have bilateral, monolete spores.

A peculiar feature of the spores of Grammitidaceae is that they often undergo precocious division within the spore wall before being released from the sporangium. Bicellular or multicellular spores are a feature of several other groups of ferns that produce chlorophyllous spores (Tryon & Lugardon, 1991). In *Terpsichore*, it appears that spores often undergo division before the spore wall is ruptured and before release from the sporangia (Table 1; Stokey & Atkinson, 1958).

New Species

Terpsichore pirrensis A. R. Smith, sp. nov. TYPE: Panama. Darién: Cerro Pirre, 2,500–4,500 ft., *Duke & Elias 13842* (holotype, UC; isotypes, MO, NY not seen, SCZ not seen). Figure 2A.

Ex affinitate *T. taxifoliae* (L.) A. R. Smith et *T. zeledonianae* (Lellinger) A. R. Smith, stipitis setis brevioribus hyalinis vel pallide rubellis 0.2–0.3 mm, rhachide glabra abaxialiter, et setis inter sporangia plerumque carentibus distinguenda; insuper differt a *T. taxifoliae* setis margine segmentorum carentibus.

Rhizome short-creeping to suberect; scales castaneous, concolorous, shining, 1.5–2.5 × 0.2–0.3 mm, entire, often with a single minute hyaline patent or oblique seta at tip; fronds mostly 15–30 cm; stipes dark brown, up to 8 cm × 0.5–1 mm, with hyaline to light reddish setulae 0.2–0.3 mm; laminae thin-chartaceous, pinnatisect, narrowly elliptic with proximal pinnae (up to ca. 12 pairs) gradually reduced to small lobes 1–3 mm long; rachises glabrous abaxially or with very sparse setae to 1.5 mm, also with black clavate fungi; segments mostly 30–55 pairs per frond, spreading to often ascending up to ca. 70° from rachis, linear-lanceolate, 1.5–2.5 cm × 2–3.5 mm, acutish at tip, lacking marginal and laminar setae; veins simple, blackish and easily visible abaxially, up to 15 pairs per segment; hydathodes lacking calcareous secretions; sori up to 15 pairs per segment, lacking setae from receptacle or setae sparse, less than 0.3 mm; sporangia glabrous.

This particular group, also including *T. taxifolia* (L.) A. R. Smith and *T. alsopteris* (C. V. Morton) A. R. Smith in Mesoamerica, is in need of revision, especially in South America where there are additional undescribed species. *Terpsichore pirrensis* is known only from Cerro Pirre.

Paratypes. PANAMA. **Darién:** same locality as type, *Duke & Elias 13754* (MO, NY not seen, SCZ not seen, UC); Serranía de Pirre, along steep ridge from Altos de Nique to Cerro Pirre, ca. 8 km N of Alturas de Nique, ca. 8 km W of Cana Gold Mine, 1,430–1,480 m, *Croat 37833* (MO); Cerro Pirre, valley between Pirre and next most southerly peak, *Folsom 4447* (MO).

Terpsichore spathulata A. R. Smith, sp. nov. TYPE: Mexico. México: Sierra de las Cruces, 11,000 ft., *Pringle 4145b* (holotype, UC; isotype, US). Figure 2B.

A *T. heteromorpha* (Hooker & Greville) A. R. Smith rhizomatis paleis parvioribus aurantiacis vel brunneolis, sporangiis sine setis, et laminis gracilioribus plerumque non furcatis aut si furcatis nunc divisionibus ca. 30° divergentibus differt.

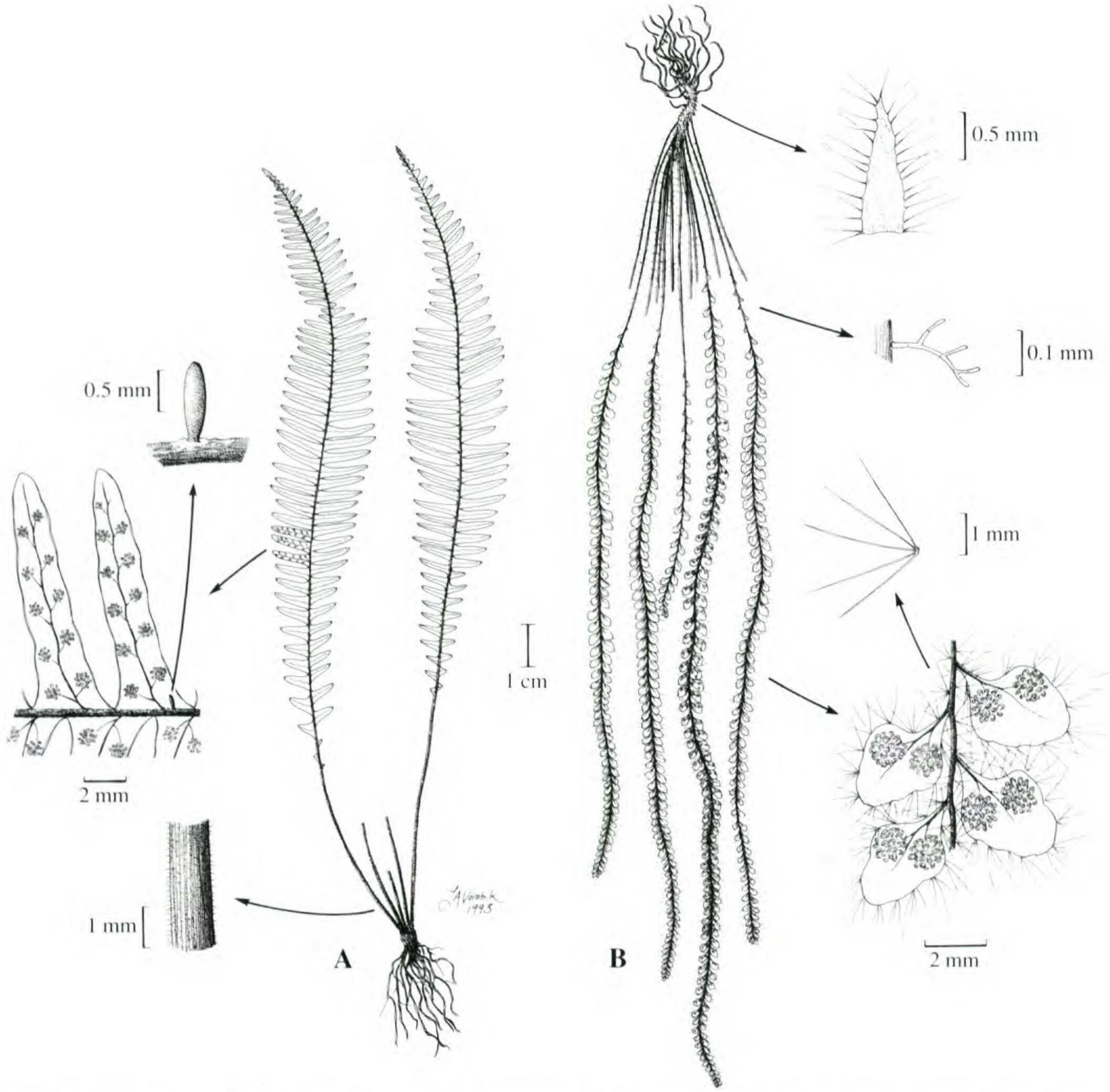

Figure 2. New species of *Terpsichore*. —A. *T. pirrensis* A. R. Smith, habit and details showing stipe base with uniformly short hairs, abaxial surface of segments, and fungal fruiting body from rachis (*Duke & Elias 13842*, UC). —B. *T. spathulata* A. R. Smith, habit and details showing rhizome scale, branched hair along rachis, stellate seta on rachis, and abaxial surface of segments, *Pringle 4145b* (UC).

Plants epipetric in moist, shaded rock crevices and on cliffs, under rock overhangs, and in shallow caves and grottoes; rhizome very short-creeping to suberect; scales orangish to brownish, concolorous, dull, 0.3–1 × 0.2–0.5 mm, somewhat obscured by dense, hyaline setae on margins and surfaces; fronds numerous, densely crowded, pendent, often more than 50 per plant, (12–)25–60(–90) cm, apices indeterminate; stipes brown, 20–150 × 0.2–0.4 mm, with numerous, mostly unbranched, tawny setae 1–2 mm; laminae 10–85 × 0.4–1.2(–1.6) cm, 1-pinnate, or occasionally rachises 1–2-bifurcate with forks ca. 30° apart, pinnae very gradually reduced and more widely separated proximally, contiguous or often overlapping distally, without black clavate fungi, thin-chartaceous; rachises brown to blackish, with numerous dark, often paired or fasciculate setae 1–2 mm; pinnae often more than 50 pairs per frond, alternate, 2–5(–7) × 2–4 mm, ascending, sessile or proximal ones stipitate to 2 mm, irregularly oval, obovate, rhombic, or slightly lobed, larger ones often inequilateral (excised basiscopically), base cuneate, apex rounded or truncate, margin setose, setae pale reddish, not paired, paired, and/or sessile-stellate; veins obscure except for the darkened costa (basal half), 1–3 pairs per pinna; laminar surface between the veins glabrous or with pale setae on both surfaces, often also with 1–3-branched hairs 0.1–0.2

mm; hydathodes without lime dots; sori usually 2–6 per pinna, lacking setae from receptacle; sporangia glabrous.

Specimens of *Terpsichore spathulata* from Mexico and Central America have previously been determined as *Grammitis heteromorpha* (Hooker & Greville) C. V. Morton. The latter species is restricted to the Andes from Colombia to Bolivia and differs by the larger (1–1.5 mm), black rhizome scales, thicker lamina and rachises, and presence of sporangial setae. In addition, Andean specimens have the lamina markedly and regularly bifurcate, with the blade forks diverging at 60–90°. Smith (1981) and Stolze (1981) have previously discussed some of the variation in *Grammitis heteromorpha* sensu lato.

Paratypes. MEXICO. **Chiapas:** Munic. Union Júarez, SE side of summit of Volcán Tacaná, 12,500 ft., *Breedlove 24297, 24303, 24304* (DS); Volcán Tacaná, 2,800 m, *Matuda 2890* m (K, MEXU, NY, US). **Distrito Federal:** Desierto de los Leones, ca. 9,600 ft., *Hernandez X. s.n.* (US), *Lyonnet 232* (US). **Jalisco:** Nevado de Colima, above Jazmín, above El Isote, 2,600 m, *McVaugh 10043* (US), 3,200 m, *McVaugh 10073* (US), ca. 4,000 m, *McVaugh 13820* (US). **México:** Sierra de las Cruces, *Pringle 4145* (US); Ixtaccíhuatl, above San Rafael, ca. 4,040 m, *Beaman 2817* (UC, US); Ixtaccíhuatl, La Joya, 3,990 m, *Beaman 3514* (US); Ixtaccíhuatl, 12,000–13,000 ft., *Purpus s.n.* (UC), *172* (US), *1596* (UC, US), 3,500 m, *Matuda 27574* (US), 4,100 m, *Rzedowski 25410* (US); La Ciénega, cerca del Llano Grande, Ixtaccíhuatl, *Rzedowski 29309* (US); arriba de El Salto, Valle de Ayoloco, Ixtaccíhuatl, *Rzedowski 23465* (US); Volcán Ixtaccíhuatl, *Moore et al. 4526* (UC, US); SE de Ixtaccíhuatl, 3,600 m, *Matuda 26113, 26114* (US); Popocatapetl, 3,400 m, *Sanchez M. 423* (US); between Km 76 and 77 on Amecameca–Popocatepetl road, ca. 3,250 m, *Beaman 2060* (UC); Cerro Cabezas, 3,500 m, *Lyonnet 1479, Sanchez S. 364* (US); Xitle Chico, *Rzedowski 938* (US). **Veracruz:** Orizaba, 11,000 ft., *Plantae Mexicanae Liebmann 2508* (US); Munic. Calcahualco, 5 km SW of Jacal, 19°05′N, 97°15′W, 3,450 m, *Nee & Diggs 24843* (UC). GUATEMALA. **Sacatepéquez:** Volcán de Agua, 3,400–3,752 m, *Pittier 24* (US). **San Marcos:** upper slopes of Volcán Tacaná, 4,100–4,400 m, *Steyermark 36134* (US).

New Combinations

Terpsichore achilleifolia (Kaulfuss) A. R. Smith, comb. nov. Basionym: *Polypodium achilleifolium* Kaulfuss, Enum. Fil. 116. 1824. *Ctenopteris achilleifolium* (Kaulfuss) J. Smith. *Grammitis achilleifolia* (Kaulfuss) R. M. Tryon & A. F. Tryon. *Distribution.* Southern Brazil. Group 5.

A species from Madagascar and the Mascarenes, *Ctenopteris torulosa* (Baker) Tardieu, is very similar to *Terpsichore achilleifolia* in blade dissection but apparently lacks hydathodes or has only faint hydathodes (Barbara Parris, in litt.).

Terpsichore alfarii (Donnell Smith) A. R. Smith, comb. nov. Basionym: *Polypodium alfarii* Donnell Smith, Bot. Gaz. 33: 262. 1902. *Ctenopteris alfarii* (Donnell Smith) Copeland. *Grammitis alfarii* (Donnell Smith) C. V. Morton. *Polypodium oligosorum* Mettenius ex Kuhn, non Klotzsch. *Distribution.* Costa Rica, Venezuela, Colombia, Ecuador. Group 3.

Terpsichore alsophilicola (H. Christ) A. R. Smith, comb. nov. Basionym: *Polypodium alsophilicola* H. Christ, Bull. Soc. Bot. Genève, II, 1: 219. 1909, as *P. alsophilicolum. Ctenopteris alsophilicola* (H. Christ) Copeland. *Grammitis alsophilicola* (H. Christ) F. Seymour. *Distribution.* Costa Rica, Panama, Colombia?, Ecuador. Group 1.

Terpsichore alsopteris (C. V. Morton) A. R. Smith, comb. nov. Basionym: *Grammitis alsopteris* C. V. Morton, Contr. U.S. Natl. Herb. 38: 112, t. 4. 1967. *Distribution.* Costa Rica, Panama, Colombia, Ecuador, Peru. Group 2.

Terpsichore amphidasyon (Kunze ex Mettenius) A. R. Smith, comb. nov. Basionym: *Polypodium amphidasyon* Kunze ex Mettenius, Abh. Senckenberg. Naturf. Ges. 2: 49. 1857. *Grammitis amphidasyon* (Kunze ex Mettenius) Duek & Lellinger. *Xiphopteris amphidasyon* (Kunze ex Mettenius) Alston. *Distribution.* Venezuela. Group 2.

Terpsichore angustipes (Copeland) A. R. Smith, comb. nov. Basionym: *Ctenopteris angustipes* Copeland, Philipp. J. Sci. 84: 404. 1956. *Grammitis angustipes* (Copeland) Lellinger. *Distribution.* Colombia. Group ?

Terpsichore asplenifolia (L.) A. R. Smith, comb. nov. Basionym: *Polypodium asplenifolium* L., Sp. Pl. 2: 1084. 1753. *Ctenopteris asplenifolia* (L.) Copeland. *Grammitis asplenifolia* (L.) Proctor. *Distribution.* Southern Mexico to Panama, Colombia and Venezuela to Bolivia, Antilles. Group 1.

Terpsichore athyrioides (Hooker) A. R. Smith, comb. nov. Basionym: *Polypodium athyrioides* Hooker, Sp. Fil. 4: 224, t. 277B. 1862. *Ctenopteris athyrioides* (Hooker) Copeland. *Grammitis athyrioides* (Hooker) C. V. Morton. *Distribution.* Peru, Bolivia. Group 2.

Polypodium yungense Rosenstock, Repert. Spec. Nov. Regni Veg. 5: 236. 1908. *Xiphopteris yungensis* (Rosenstock) Crabbe.

Terpsichore atroviridis (Copeland) A. R. Smith, comb. nov. Basionym: *Ctenopteris atroviridis* Copeland, Philipp. J. Sci. 84: 461. 1956. *Grammitis atroviridis* (Copeland) F. Seymour. *Distribution.* Nicaragua, Costa Rica, Panama. Group 1.

Terpsichore attenuatissima (Copeland) A. R. Smith, comb. nov. Basionym: *Ctenopteris attenuatissima* Copeland, Philipp. J. Sci. 84: 456, t. 11. 1956. *Grammitis attenuatissima* (Copeland) C. V. Morton. *Distribution.* Ecuador. Group 2.

Terpisichore chrysleri (Copeland) A. R. Smith, comb. nov. Basionym: *Ctenopteris chrysleri* Copeland, Philipp. J. Sci. 84: 448. 1956. *Grammitis chrysleri* (Copeland) Proctor. *Distribution.* Costa Rica, Panama, Colombia and Venezuela to Bolivia, Brazil, Jamaica, Hispaniola. Group 1.

Terpsichore concinna (A. R. Smith) A. R. Smith, comb. nov. Basionym: *Grammitis concinna* A. R. Smith, Ann. Missouri Bot. Gard. 76: 338. 1989. *Polypodium concinnum* Mettenius ex Kuhn, Linnaea 36: 132. 1869, not Willdenow, Sp. Pl., ed. 4. 5: 201. 1810 (= *Thelypteris concinna* (Willd.) Ching). *Distribution.* Venezuela. Group 3.

Terpsichore cretata (Maxon) A. R. Smith, comb. nov. Basionym: *Polypodium cretatum* Maxon, Amer. Fern J. 5: 51. 1915. *Ctenopteris cretata* (Maxon) Copeland. *Grammitis cretata* (Maxon) Proctor. *Distribution.* Cuba, Hispaniola, Jamaica. Group 4.

Terpsichore cultrata (Bory ex Willdenow) A. R. Smith, comb. nov. Basionym: *Polypodium cultratum* Bory ex Willdenow, Sp. Pl., ed. 4. 5: 187. 1810. *Ctenopteris cultrata* (Bory ex Willdenow) Copeland. *Grammitis cultrata* (Bory ex Willdenow) Proctor. *Xiphopteris cultrata* (Bory ex Willdenow) Schelpe. *Distribution.* Southern Mexico to Panama, Colombia and Venezuela to Bolivia, Brazil, Antilles; Africa, Madagascar, Mauritius, Réunion, and the Seychelles Islands. Group 3.

Polypodium elasticum Bory ex Willdenow, Sp. Pl., ed. 4. 5: 183. 1810. *Ctenopteris elastica* (Bory ex Willdenow) Copeland. *Xiphopteris elastica* (Bory ex Willdenow) Alston.

Polypodium reclinatum Brackenridge, Expl. Exp. 16: 11. 1854. *Ctenopteris reclinata* (Brackenridge) Copeland.

Polypodium ciliare Fée, Crypt. Vasc. Brésil 1: 94, t. 27, f. 2. 1869. *Ctenopteris ciliaris* (Fée) Copeland.

Polypodium ovalescens Fée, Crypt. Vasc. Brésil 1: 94, t. 27, f. 3. 1869.

Terpsichore david-smithii (Stolze) A. R. Smith, comb. nov. Basionym: *Grammitis david-smithii* Stolze, Fieldiana, Bot., n.s. 32: 109. 1993. *Distribution.* Peru, Bolivia. Group 2.

Terpsichore delicatula (M. Martens & Galeotti) A. R. Smith, comb. nov. Basionym: *Polypodium delicatulum* M. Martens & Galeotti, Nouv. Mém. Acad. Roy. Sci. Bruxelles 15(5): 35, pl. 7, f. 1. 1842. *Ctenopteris delicatula* (M. Martens & Galeotti) J. Smith. *Grammitis delicatula* (M. Martens & Galeotti) F. Seymour. *Distribution.* Southern Mexico, Guatemala. Group 3.

Terpsichore dependens (Baker) A. R. Smith, comb. nov. Basionym: *Polypodium dependens* Baker, Syn. Fil. 335. 1867. *Grammitis dependens* (Baker) C. V. Morton. *Distribution.* Colombia, Ecuador, Peru, Bolivia. Group 3.

Terpsichore dolorensis (Hieronymus) A. R. Smith, comb. nov. Basionym: *Polypodium dolorense* Hieronymus, Bot. Jahrb. Syst. 34: 512. 1905. *Grammitis dolorensis* (Hieronymus) Lellinger. *Distribution.* Colombia. Group 1.

Terpsichore eggersii (Baker ex Hooker) A. R. Smith, comb. nov. Basionym: *Polypodium eggersii* Baker ex Hooker, Icon. Pl. t. 1671. 1886. *Grammitis eggersii* (Baker ex Hooker) Proctor. *Distribution.* Lesser Antilles. Group 1.

Terpsichore exornans (Maxon) A. R. Smith, comb. nov. Basionym: *Polypodium exornans* Maxon, Amer. Fern J. 18: 47. 1928. *Ctenopteris exornans* (Maxon) Copeland. *Grammitis exornans* (Maxon) Proctor. *Distribution.* Jamaica. Group 1.

Terpsichore gradata (Baker) A. R. Smith, comb. nov. Basionym: *Polypodium gradatum* Baker, Fl. Bras. 1(2): 513. 1870. *Ctenopteris gradata* (Baker) Copeland. *Grammitis gradata* (Baker) R. M. Tryon & A. F. Tryon. *Distribution.* Southern Brazil. Group 5.

Polypodium schwackei H. Christ in Schwacke, Pl. Nov. Mineiras 2: 20. 1900. *Ctenopteris schwackei* (H. Christ) Copeland.

Terpsichore hanekeana (Proctor) A. R. Smith, comb. nov. Basionym: *Grammitis hanekeana* Proctor, Mem. New York Bot. Gard. 53: 341. 1989. *Distribution.* Puerto Rico. Group 1.

Terpsichore heteromorpha (Hooker & Greville) A. R. Smith, comb. nov. Basionym: *Polypodium heteromorphum* Hooker & Greville, Icon. Fil. 1: pl. 108. 1829. *Ctenopteris heteromorpha* (Hooker & Greville) Copeland. *Grammitis*

heteromorpha (Hooker & Greville) C. V. Morton. *Xiphopteris heteromorpha* (Hooker & Greville) Crabbe. *Distribution.* Colombia, Ecuador, Peru. Group 3.

Terpsichore immixta (Stolze) A. R. Smith, comb. nov. Basionym: *Grammitis immixta* Stolze, Fieldiana, Bot., n.s. 32: 115. 1993. *Distribution.* Peru. Group 3.

Terpsichore jamesonioides (Fée) A. R. Smith, comb. nov. Basionym: *Polypodium jamesonioides* Fée, Mém. Soc. Sci. Hist. Nat. Strasbourg 5 [Mém. Foug. 7]: 59, t. 21, f. 4. 1857. *Ctenopteris jamesonioides* (Fée) Copeland. *Grammitis jamesonioides* (Fée) C. V. Morton. *Distribution.* Costa Rica, Panama, Venezuela and Colombia to Peru. Group 3.

Ctenopteris nudipes Copeland, Philipp. J. Sci. 84: 405, t. 4. 1956.

Terpsichore jenmanii (Underwood ex Maxon) A. R. Smith, comb. nov. Basionym: *Polypodium jenmanii* Underwood ex Maxon, Contr. U.S. Natl. Herb. 16: 62. 1912. *Ctenopteris jenmanii* (Underwood ex Maxon) Copeland. *Grammitis jenmanii* (Underwood ex Maxon) Proctor. *Distribution.* Jamaica and Hispaniola. Group 1.

Terpsichore kegeliana (Kunze) A. R. Smith, comb. nov. Basionym: *Polypodium kegelianum* Kunze, Linnaea 21: 210. 1848. *Ctenopteris kegeliana* (Kunze) K. U. Kramer. *Grammitis kegeliana* (Kunze) Lellinger. *Distribution.* Surinam, French Guiana. Group ?

Terpsichore lanigera (Desvaux) A. R. Smith, comb. nov. Basionym: *Polypodium lanigerum* Desvaux, Ges. Naturf. Freunde Berlin Mag. Neuesten Entdeck. Gesammten Naturk. 5: 316. 1811. *Ctenopteris lanigera* (Desvaux) Copeland. *Grammitis lanigera* (Desvaux) C. V. Morton. *Xiphopteris lanigera* (Desvaux) Crabbe. *Distribution.* Costa Rica, Panama, Colombia to Bolivia, Hispaniola, Lesser Antilles. Group 3.

Terpsichore laxa (C. Presl) A. R. Smith, comb. nov. Basionym: *Polypodium laxum* C. Presl, Reliq. Haenk. 1: 23, t. 4, f. 1. 1825. *Grammitis laxa* (C. Presl) C. V. Morton. *Distribution.* Ecuador, Peru, Bolivia. Group 3.

Ctenopteris contacta Copeland, Philipp. J. Sci. 84: 447. 1956.

Terpsichore lehmanniana (Hieronymus) A. R. Smith, comb. nov. Basionym: *Polypodium lehmannianum* Hieronymus, Bot. Jahrb. Syst. 34: 513. 1904. *Ctenopteris lehmanniana* (Hieronymus) Copeland. *Distribution.* Guatemala to Panama, Colombia, Ecuador. Group 1.

Terpsichore leucosticta (J. Smith) A. R. Smith, comb. nov. Basionym: *Ctenopteris leucosticta* J. Smith, Hist. Fil. 185. 1875, a nom. nov. for *Polypodium leucosticton* Fée, not Kunze ex Klotzsch (1847), Gen. Fil. 240. 1852. *Polypodium longiusculum* C. Christensen, nom. nov. for *P. leucosticton* Fée. *Ctenopteris longiuscula* (C. Christensen) Copeland. *Grammitis leucosticta* (J. Smith) C. V. Morton. *Distribution.* Venezuela, Ecuador, Peru. Group 2.

Terpsichore liogieri (Proctor) A. R. Smith, comb. nov. Basionym: *Grammitis liogieri* Proctor, Mem. New York Bot. Gard. 53: 341. 1989. *Distribution.* Puerto Rico. Group 1.

Terpsichore longa (C. Christensen) A. R. Smith, comb. nov. Basionym: *Polypodium longum* C. Christensen, Index. Fil. 541. 1906, a nom. nov. for *P. alternifolium* Hooker, Sp. Fil. 4: 222, t. 277A, 1862, not Willdenow, Sp. Pl., ed. 4. 5: 168. 1810 (= *Microsorum alternifolium* (Willdenow) Copel). *Ctenopteris longa* (C. Christensen) Copeland. *Xiphopteris longa* (C. Christensen) Alston. *Distribution.* Costa Rica, Ecuador. Group 3.

Terpsichore longisetosa (Hooker) A. R. Smith, comb. nov. Basionym: *Polypodium longisetosum* Hooker, Sp. Fil. 4: 225. 1864. *Distribution.* Costa Rica, Panama, Venezuela, Ecuador to Bolivia. Group 5.

Polypodium myriophyllum Mettenius ex Hooker & Baker, Syn. Fil. 338. 1868. *Ctenopteris myriophylla* (Mettenius ex Hooker & Baker) Copeland. *Grammitis myriophylla* (Mettenius ex Hooker & Baker) C. V. Morton. *Xiphopteris myriophylla* (Mettenius ex Hooker & Baker) Crabbe.

Polypodium piligerum Hooker (Hooker's Icon. Pl. 4: t. 321. 1841), type from Ecuador, appears to be this species and an earlier name, but the rhizome was described as with scales "nigro-fuscentibus, nitidis." Specimens of *T. longisetosa* seen from Mesoamerica, as well as from Venezuela and Ecuador, have orange-brown, rather dull scales. Morton (1967) did not account for *Polypodium piligerum* in his treatment of Grammitidaceae for Ecuador.

Terpsichore mollissima (Fée) A. R. Smith, comb. nov. Basionym: *Polypodium mollissimum* Fée, Hist. Foug. Antill. [Mém. Foug. 11]: 47, t. 12, f. 2. 1866. *Ctenopteris mollissima* (Fée) Copeland. *Grammitis mollissima* (Fée) Proctor.

Distribution. Southern Mexico to Panama, Venezuela, Ecuador, Antilles. Group 3.

Terpsichore paulistana (Brade & Rosenstock) A. R. Smith, comb. nov. Basionym: *Polypodium paulistanum* Brade & Rosenstock, Arch. Inst. Biol. Veg. Rio Janeiro 2: 3, t. 1(4), 4. 1935. *Distribution.* Southern Brazil. Group 2.

Terpsichore pichinchae (Sodiro) A. R. Smith, comb. nov. Basionym: *Polypodium pichinchae* Sodiro, Crypt. Vasc. Quit. 329. 1893. *Ctenopteris pichinchae* (Sodiro) Copeland. *Grammitis pichinchae* (Sodiro) C. V. Morton. *Distribution.* Ecuador. Group 2.

Terpsichore pichinchense (Hieronymus) A. R. Smith, comb. nov. Basionym: *Polypodium pichinchense* Hieronymus, Bot. Jahrb. Syst. 34: 506. 1904. *Polypodium ecuadorense* C. Christensen, nom. superfl. *Grammitis pichinchense* (Hieronymus) C. V. Morton. *Distribution.* Ecuador, Peru. Group 2.

Terpsichore semihirsuta (Klotzsch) A. R. Smith, comb. nov. Basionym: *Polypodium semihirsutum* Klotzsch, Linnaea 20: 379. 1847. *Ctenopteris semihirsuta* (Klotzsch) Copeland. *Grammitis semihirsuta* (Klotzsch) Proctor. *Distribution.* Southern Mexico to Panama, Jamaica, Hispaniola, Venezuela and Colombia to Bolivia, Brazil. Group 2.

Polypodium gratum Fée, Crypt. Vasc. Brésil 1: 242, t. 76, f. 2. 1869.

Terpsichore senilis (Fée) A. R. Smith, comb. nov. Basionym: *Polypodium senile* Fée, Mém. Soc. Sci. Hist. Nat. Strasbourg 5 [Mém. Foug. 7]: 60, t. 25, f. 1. 1857. *Ctenopteris senilis* (Fée) Copeland. *Grammitis senilis* (Fée) C. V. Morton. *Distribution.* Southern Mexico to Panama, Colombia, Venezuela, Ecuador, Peru, and Bolivia. Group 3.

Polypodium subflabelliforme Rosenstock, Repert. Spec. Nov. Regni Veg. 7: 306. 1909. *Ctenopteris subflabelliformis* (Rosenstock) Copeland. *Grammitis subflabelliformis* (Rosenstock) C. V. Morton.

Terpsichore staheliana (Posthumus) A. R. Smith, comb. nov. Basionym: *Polypodium staheli-anum* Posthumus, Recueil Trav. Bot. Néerl. 23: 401. 1928. *Ctenopteris staheliana* (Posthumus) K. U. Kramer. *Grammitis staheliana* (Posthumus) Lellinger. *Distribution.* Nicaragua, Costa Rica, Panama, Surinam, Venezuela, Colombia? Group 1.

Terpsichore subtilis (Kunze ex Klotzsch) A. R. Smith, comb. nov. Basionym: *Polypodium subtile* Kunze ex Klotzsch, Linnaea 20: 375. 1847. *Ctenopteris subtilis* (Kunze ex Klotzsch) J. Smith. *Grammitis subtilis* (Kunze ex Klotzsch) C. V. Morton. *Distribution.* Southern Mexico to Panama, Venezuela, Colombia, Ecuador. Group 4.

Terpsichore taxifolia (L.) A. R. Smith, comb. nov. Basionym: *Polypodium taxifolium* L., Sp. Pl. 2: 1086. 1753. *Ctenopteris taxifolia* (L.) Copeland. *Grammitis taxifolia* (L.) Proctor. *Distribution.* Costa Rica, Panama, Antilles, Venezuela, Ecuador, Surinam, Brazil. Group 2.

Polypodium l'herminieri Fée var. *costaricense* Rosenstock, Repert. Spec. Nov. Regni Veg. 22: 17. 1925.

Terpsichore turrialbae (H. Christ) A. R. Smith, comb. nov. Basionym: *Polypodium turrialbae* H. Christ, Bull. Soc. Roy. Bot. Belgique 35: Mém. 226. 1896. *Ctenopteris turrialbae* (H. Christ) Copeland. *Grammitis turrialbae* (H. Christ) F. Seymour. *Distribution.* Costa Rica, Panama. Group 3.

Terpsichore variabilis (Mettenius ex Kuhn) A. R. Smith, comb. nov. Basionym: *Polypodium variabile* Mettenius ex Kuhn, Linnaea 36: 133. 1869. *Grammitis variabilis* (Mettenius ex Kuhn) C. V. Morton. *Distribution.* Colombia, Ecuador, Peru. Group 3.

Terpsichore xanthotrichia (Klotzsch) A. R. Smith, comb. nov. Basionym: *Polypodium xanthotrichium* Klotzsch, Linnaea 20: 376. 1847. *Grammitis xanthotrichia* (Klotzsch) Duek & Lellinger. *Distribution.* Venezuela. Group 3.

Terpsichore zeledoniana (Lellinger) A. R. Smith, comb. nov. Basionym: *Grammitis zeledoniana* Lellinger, Proc. Biol. Soc. Wash. 98: 383. 1985, nom. nov. for *Polypodium taxifolium* L. var. *fragillimum* H. Christ, Bull. Herb. Boissier, sér. 2. 4: 1103. 1904. *Distribution.* Costa Rica, Panama. Group 2.

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